July 2021

# Binder 151, Opecoelidae P-Pn [Trematoda Taxon Notebooks]

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Opecoelidae

PACIFICREADIUM Durio & Manter, 1968

***Pacificreadium* gen. n.**

A new genus, *Pacificreadium*, is proposed for *Hamacreadium serrani* Nagaty and Abdel Aal, 1962 from "*Serranus miniatus*" in the Red Sea. Specimens we consider to be this same species were collected from *Epinephelus* sp. in New Caledonia and from serranid fishes in Australia.

The genus *Pacificreadium* is like *Cainocreadium* except that the excretory vesicle extends across the cecal bifurcation to end alongside the pharynx. Even in immature specimens this far anterior extent of the vesicle is conspicuous. The chief correction to be made in the original description of "*Hamacreadium serrani*" is that the tubular branches near the pharynx are not branches of the ceca but of the excretory vesicle (Fig. 7). A redescription of the type species based on specimens from New Caledonia and Australia follows.

Opecoelidae

from Durio & Manter, 1968

***Pacificreadium serrani***
**(Nagaty and Abdel Aal, 1962) comb. n.**
(Figs. 6–8)

*Synonym:* *Hamacreadium s.* Nagaty and Abdel Aal, 1962.

*Hosts and localities:* *Epinephelus* sp., Serranidae; New Caledonia. *E. merra* Bloch; Heron Island, Queensland, Australia. *Plectropomus maculatus* (Bloch); Serranidae; Heron Island, Australia.

*Location:* Intestine.

*Number:* 15.

*Specimens deposited:* USNM Helm. Coll. No. 63312.

*Description* (based on 15 specimens, with measurements on 5): Body slender, tapering toward each end but more pointed posteriorly. Length 3.818 to 6.137 mm; width 0.855 to 1.140 mm. Forebody 1.273 to 1.960 mm or about ⅓ body length. Oral sucker 288 to 301 wide; acetabulum 448 to 502 wide; sucker ratio 1:1.55 to 1.8, usually about 1:1.7. Pharynx longer than wide; esophagus muscular, usually somewhat longer than pharynx but varying with contraction; bifurcation about ¼ to ⅓ distance between anterior end and acetabulum; ceca not reaching posterior end of body by short distance.

Testes subspherical, smooth or with irregular indentations, tandem or subtandem, about midway between acetabulum and posterior end of body; posttesticular space 0.912 to 1.824 mm or about ¼ to ⅓ body length. Cirrus sac (Fig. 8) elongate; 0.683 to 1.072 mm by 134 to 174; overlapping anterior edge of acetabulum; containing undivided seminal vesicle in form of a broad tube filling posterior half of sac, few prostatic cells, and long tubular cirrus often inserted into metraterm. Genital pore median, about midway between suckers.

Ovary irregularly lobed, usually with 7 or 8 lobes; immediately anterior to anterior testis. Seminal receptacle present but inconspicuous because dorsal to anterior part of ovary. Vitellaria filling most of body from level of esophagus to near posterior end, confluent throughout forebody and posterior to testes. Uterus preovarian. Eggs 64 to 70 by 38 to 41.

Excretory vesicle extending dorsal to testes, dorsal to acetabulum, ventral to cecal bifurcation, ending alongside pharynx; with or without branches in region of cecal bifurcation; often with branch on each side of pharynx (Fig. 7).

**Remarks**

The above description corrects the misinterpretation of the branches of the excretory vesicle. These are close to the ceca but are ventral, stain differently, and contain dark-staining granules. Our specimens show that the testes may or may not be smooth and may be tandem as well as slightly diagonal. Nagaty and Abdel Aal (1962) state the sucker ratio to be 1:2, although their figure shows a more nearly 1:1.8 ratio. Our ratios are 1:1.6 to 1:1.8.

The nearest related species is probably *Cainocreadium serrani* (Nagaty, 1956) which differs in that the excretory vesicle passes between the testes and does not extend anterior to the acetabulum, and the genital pore is nearer the cecal bifurcation.

*Pacificreadium serrani* is now known from New Caledonia, Australia, and the Red Sea.

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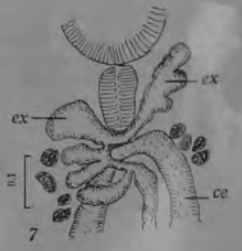

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Pacificreadium serrani (Nagaty & Abdel Aal, 1962) Durio & Manter

Lainocreadioidas

~~Hamacreadium serrani sp. n.~~ NAGATY & ABDEL AAL, 1962

(fig. 2)

Description based on whole mount of two specimens (on one slide) from *Serranus miniatus* locally called "koshar (nagel)." Body elongate, flattened 4.70 to 6.72 long; 1.30 to 1.51 wide; anterior end broadly rounded, tapered posteriorly; cuticle smooth. Oral sucker 0.25 to 0.42 by 0.29 to 0.46, subterminal, 0.04 to 0.13 from anterior extremity. Pharynx small 0.17 by 0.21 by 0.25. Esophagus 0.08 to 0.15 long. Intestinal ceca terminating 0.55 from posterior extremity; with lateral diverticula near cecal bifurcation from posterior border of pharynx to about level of genital pore. Ventral sucker 0.55 to 0.59 by 0.71 to 0.76, in second quarter of body length; 1.26 to 1.51 from oral sucker. Ratio of oral to ventral suckers 1:2.

Testes two, intercecal, smooth, 0.42 by 0.46 to 0.55, diagonal, in third quarter of body length. Cirrus sac well developed, 0.84 to 0.92 by 0.25, extending posteriorly on left of acetabulum to about its midlevel. Cirrus protruded in one specimen, measuring 1.01 by 0.17. Genital pore median, about midway between intestinal bifurcation and acetabulum.

Ovary 0.25 by 0.55, with three to seven lobes, submedian to left, immediately anterior to anterior testis. Receptaculum seminis just preovarian, 0.17 to 0.21 by 0.08 to 0.17. Vitellaria extensive, of small follicles, throughout body posterior to pharynx. Uterus preovarian. Eggs oval, averaging 0.07 by 0.03. Excretory vesicle tubular, extending nearly to level of anterior third of acetabulum.

*Comparisons:* This species resembles *H. mutabile* Linton, 1910, but differs from it in having: (1) lateral intestinal diverticula at bifurcation; (2) the excretory vesicle extends nearly to level of anterior third of acetabulum; (3) a submedian genital pore about midway between intestinal bifurcation and acetabulum; and (4) vitelline follicles reaching posterior border of pharynx.

*H. serrani* differs from *H. lethrini* mainly in: (1) anterior extent of vitellaria, (2) posterior extent of cirrus sac, (3) position of genital pore, and (4) shape of ovary.

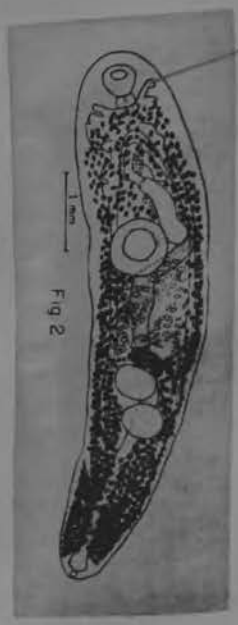


Fig 2

Lainocreadium ~~H. serrani~~ H. NDM.

PACIFICREADIUM

1972

Род PARADACTYLOSTOMUM Zhukov gen. n.

Сем. *Allocreadiidae* (подсем. *Opecoelinae*). Мелкие черви, кутикула гладкая. Передний конец слегка заострен. Ротовая присоска меньше брюшной. Последняя характерной кувшиновидной формы. По бокам ее входного отверстия расположены два пальцевидных отростка. Пищевод длинный. Ветви кишечника сливаются в задней части тела. Половое отверстие расположено субмедианно. Сумка цирруса отсутствует. Семенной пузырек значительной длины. Семенники лопастные, лежат друг за другом. Яичник трехлопастной. Желточники тянутся по бокам тела от уровня бифуркации кишечника до заднего конца тела, где соединяются в одно поле. Петли матки между брюшной присоской и передним семенником. Паразит кишечника морских рыб. Типичный и пока единственный вид — *Paradactylostomum indicum* Zhukov gen. et sp. n. По наличию пальцевидных отростков брюшной присоски описываемый род приближается к роду *Dactylostomum* Woolcock, 1935, отличаясь от него числом и формой указанных отростков, строением брюшной присоски и положением полового отверстия.

## Paradactylostomum indicum Zhukov, 1972

1972

**Paradactylostomum indicum** Zhukov, ~~gen. et sp. n.~~ (рис. 2). Паразит кишечника *Engraulus telara* (Ham.). Длина червей (по 5 экз.) 1.12—1.45 мм, ширина 0.35—0.47 мм. Кутикула гладкая. Передняя присоска 0.062—0.075×0.075—0.092 мм, глотка 0.046—0.050×0.039—0.041 мм. Пищевод 0.083—0.14 мм. Брюшная присоска 0.12—0.14×0.11—0.13 мм, кувшинообразной формы. По бокам ее входного отверстия расположены два пальцевидных отростка. Их длина 0.025 мм, ширина 0.012 мм. Кишечные стволы сливаются. Половое отверстие расположено приблизительно на середине расстояния между уровнем бифуркации кишечника и отверстием брюшной присоски. Сумка цирруса отсутствует. Слегка извитой семенной пузырек огибает брюшную присоску и достигает яичника трехлопастной формы. Семенники лежат друг за другом, их края сильно изрезаны. Желточные фолликулы двумя полями тянутся по бокам тела и соединяются в задней части. Петли матки заполняют пространство между брюшной присоской и передним семенником. Яйца 0.046—0.050×0.025—0.029 мм.

Хозяин: *Engraulus telara* (Ham.). Локализация: кишечник. Место обнаружения: эстуарий р. Хугли, Бенгальский залив.


Рис. 2 *Paradactylostomum indicum* Zhukov gen. et sp. n.

PARADACTYLOSTOMUM

Opecoelidae

*Paropecoelus* gen. n. Pritchard, 1966

Generic diagnosis: Opecoelidae. Body elongate, unspined. Oral sucker subterminal. Prepharynx short. Esophagus short. Ceca united posteriorly; anus ventral. Acetabulum near anterior end of body on short peduncle, with 8 or 16 peripheral papillae and 0 or 4 apertural papillae. Testes tandem, ovoid or lobed, near middle of hindbody. External seminal vesicle usually tubular, sometimes saccular, extending posterior to acetabulum about halfway to ovary. Cirrus sac small, preacetabular, enclosing cirrus and rather indistinct pars prostatica. Genital pore to left of median line at level of esophagus. Ovary pretesticular, median, usually lobed, sometimes spherical. No seminal receptacle but sperm cells may be present in uterus. Laurer's canal present in some species, probably in all. Uterus winding between ovary and genital pore, metraterm short and inconspicuous, or absent. Vitellaria extending along ceca in hindbody, confluent posterior to testes. Excretory vesicle tubular, extending almost to level of ovary. Parasitic in intestine of marine fishes.



Type species: *P. sogandaresi* sp. n. (below) in *Parupeneus pleurostigma* (type host), *P. multifasciatus*, *P. chrysonemus*, *P. porphyreus*, Hawaii. A new species has been selected as type species because its holotype is readily available in the United States National Museum Helminthological Collection.

Other species:

*P. adelongatus* (Nagaty, 1954) n. comb. (syn. *Opecoelus a.* Nagaty, 1954) in *Upeneoides vittatus* (Forskål) and *Mulloides auriflamma* (Forskål); Red Sea.

*P. elongatus* (Ozaki, 1925) n. comb. (syn. *Opecoelus e.* Ozaki, 1925) in *Upeneus pleurospilos* Bleeker; Nagasaki, Japan.

*P. palawanensis* (Fischthal and Kuntz, 1964) n. comb. (syn. *Opecoelus p.* Fischthal and Kuntz, 1964) in *Parupeneus indicus* (Shaw) and *P. barberinus* (Lacépède); Philippines.

*P. sacculatus* sp. n. (below) in *Parupeneus multifasciatus* (type host) and *P. chrysonemus*; Hawaii.

*P. thapari* (Nagaty, 1954) n. comb. (syn. *Opecoelus t.* Nagaty, 1954) in *Upeneoides vittatus* (Forskål); Red Sea.

*P. upenoides* (Nagaty, 1954) n. comb. (syn. *Opecoelus u.* Nagaty, 1954) in *Upeneoides vittatus* (Forskål): Red Sea.

Key to species of *Paropecoelus* from Hawaiian fishes

1. Laurer's canal opening anterior to ovary . . . . . 2
   Laurer's canal opening anterosinistral to ovary . . . . . *P. sogandaresi*
   Laurer's canal opening posterosinistral to ovary . . . . . *P. lanceolatus*
2. Laurer's canal opening dorsal to ootype . . . . . *P. sacculatus*
   Laurer's canal opening much anterior to ootype . . . . . *P. parupenei*

*Paropecoelus sogandaresi* sp. n. Pritchard, 1966
(Figs. 5—7)

Hosts: *Parupeneus pleurostigma* (Bennett), malu (Mullidae), type host; 8 specimens from 2 of 6 hosts.

*P. multifasciatus* (Quoy and Gaimard), moano; 5 specimens from 2 of 29 hosts.

*P. chrysonemus* (J. and E.); 2 specimens from 1 of 24 hosts.

*P. porphyreus* (Jenkins), kumu; 2 specimens from 1 of 4 hosts.

Location: Intestine.

Holotype: No. 60349

Description (based on 11 specimens): Body 2.535 to 4.477 mm long by 278 to 518 wide. Oral sucker 101 to 141 wide by 94 to 147 long, up to 168 deep; forebody one-twelfth to one-sixth body length, tapering toward anterior end; acetabulum pedunculate, 134 to 255 deep by 144 to 268 long, in ventral view (one specimen, Fig. 6) 228 wide by 225 long, sucker ratio 1 : 1.67; two apertural papillae on anterior margin of aperture may interlock with two similar papillae on posterior margin; near each corner of aperture a process forks to form four papillae (Fig. 6), making a total of 16 peripheral papillae. Prepharynx 7 to 37 long; pharynx 74 to 138 long by 76 to 138 wide; esophagus slender, 120 to 224 long; ceca bifurcating slightly anterior



to acetabular stalk, joining at posterior end of body; rectum short; anus ventral and subterminal.

Testes tandem, near but not contiguous, mostly in posterior half of hindbody, 240 to 442 long by 160 to 308 wide, irregularly lobed; posttesticular space one-fifth to one-fourth body length. Seminal vesicle (Fig. 7) tubular, sinuous, intercecal but dorsal to uterus on right side of body, approximately 480 to 824 long (as measured in one plane) by 27 to 67 wide, extending from level of anterior vitellaria to about midacetabulum; slender, slightly sinuous duct, 8 to 15 wide, arising from anterior end of vesicle and extending forward. Thin-walled cirrus sac 50 to 67 long by 27 to 48 wide, enclosing cirrus; few small gland cells outside base of cirrus sac. Genital pore sinistral, opposite midesophagus.

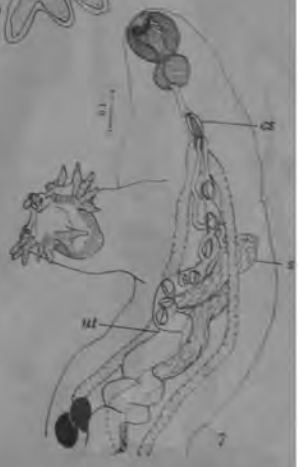
Ovary ovoid or indistinctly lobed, pretesticular, 133 to 248 long by 96 to 201 wide; Mehlis' gland preovarian; Laurer's canal present, pore on median line dorsal to ovary; uterus preovarian, coiling between ceca and narrowing considerably anterior to acetabulum, proximal coils of uterus may contain sperm cells. Vitellaria follicular, extending laterally along ceca from about midway between ovary and acetabulum to posterior end of body, intruding between testes and between anterior testis and ovary, more or less filling posttesticular space; longitudinal collecting ducts ventromedian to ceca, sometimes prominent; vitelline reservoir preovarian, ovoid, varying in size. Eggs yellow, thin-shelled, 48 to 56 long by 37 to 43 wide.

Excretory pore terminal; vesicle I-shaped, extending anterior to anterior testis, sometimes to ovary.

This species is named in honor of Dr. Franklin Sogandares-Bernal, American parasitologist at Tulane University.

Discussion: *Paropecoelus sogandaresi* is most like *P. adelongatus* (Nagaty, 1954) from *Upeneoides vittatus* (Forskål) in the Red Sea. It differs, however, in having 16 rather than eight peripheral papillae on the acetabulum; anterior extent of vitellaria halfway between the ovary and the acetabulum rather than stopping at the level of the ovary; and an unlobed, or much less distinctly lobed ovary.





92. ***Paropecoelus sogandaresi*** Pritchard, 1966
(Fig. 106)

HABITAT: Intestine of *Parupeneus pleurostigma* (local name "malu"); Hawaii.

DESCRIPTION (based on two specimens): Body 3.7-4.1 X 0.33-0.4 mm. Oral sucker 0.11-0.12 X 0.11-0.13 mm; pharynx 90-100 X 80-90 $\mu$; esophagus 0.1-0.18 mm long; anus distinct; acetabulum 0.17-0.19 mm in diameter, with two pairs of small median papillae and two pairs of prominent submedian papillae, each submedian papilla bifurcating near base into two bifid branches as shown by Pritchared in her Figure 6; testes tandem, separated, coarsely four-lobed, 0.38-0.54 X 0.21-0.31 mm; post-testicular space one-fourth to one-third of body length; ovary two-lobed, 0.18-0.24 X 0.16-0.18 mm; Laurer's canal opening dorsally to left of ovary.

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DISCUSSION: Pritchard gave the egg size as 48-56 $\mu$ by 37-43 $\mu$, but in my specimens the eggs measured 39-46 $\mu$ by 30-33 $\mu$ in life and 46-54 X 30-35 $\mu$ in balsam mounts. It seems very likely that Pritchard measured the eggs in mounted condition alone. This difference in egg size is obviously due to the difference in the technique employed rather than to a specific difference. In this connection I would like to point out that egg measurements should be made, whenver possible, on the living eggs, since the natural size can be made out in this condition alone. Cf. Footnote on p.

FAMILY: OPECOELIDAE

*Opecoelus adelongatus* n. Nagaty, 1954

Figures 1–3

Forty stained and mounted specimens were available for examination. These worms were obtained from the alimentary tracts of 25 *Upenoides vittatus* locally called "Enber baladi," from Ghardaga and Koseir, and from 5 *Mulloides auriflamma* locally called "Enber" from Ghardaga.

*Description:* Body narrow, elongated and almost cylindrical, with more or less parallel margins, slightly converging in anterior quarter of body. Preacetabular portion quite short, distinctly narrower than remainder of body in unpressed specimens. Body rounded posteriorly. Length 1.052 to 4.114 mm. by 0.273 to 0.595 mm. in maximum breadth. Acetabulum larger than oral sucker, located about one-ninth of body length from anterior end, slightly pedunculated, being borne on short broad stalk. Acetabulum complicated, consisting of usual muscular cup, 0.147 to 0.315 mm. in diameter, and 12 processes each having an outer covering of body cuticula and core from musculature of sucker. Eight acetabular processes located peripherally and arranged in somewhat separated pairs, one pair extending from each antero- and each postero-lateral sector of acetabulum. Each pair originating from short thick common trunk, divided distally into 2 processes, gradually tapering toward their tips. Four remaining processes digitiform, located nearer sucker opening, 2 originating anterior and 2 posterior to sucker opening which they may close when interlocked. Median processes in 1 specimen 0.042 to 0.063 mm. long, peripheral processes 0.084 to 0.105 mm. Papillae sometimes retracted and difficult to observe. Cuticle smooth and unarmed.

Oral sucker anterior, subterminal and ventral, measuring 0.082 to 0.147 mm. in diameter. Prepharynx very short, pharynx muscular, well-developed, spindle-shaped, 0.105 to 0.168 mm. long by 0.063 to 0.126 mm. wide. Esophagus of medium length, intestinal forking anterior to ventral sucker. Crura simple, laterally situated, and uniting near posterior end of body to form an arc connected to outside by short tube, opening independently through sub-terminal ventral anal pore.

Testes 2, in tandem, indented, situated in middle third of body between crura. Indentations variable, sometimes one or both testes very little indented. Testes subequal, 0.147 to 0.35 mm. in diameter, separated by variable distances in different specimens, equalling width of testes or much less. Vesicula seminalis externa comparatively long and tortuous, measuring about one quarter total length of worm, beginning posteriorly between crura about mid-way between ventral sucker and ovary, and proceeding anteriorly, meanwhile becoming more slender. Cirrus sac indistinct, situated usually toward left side of body at level of intestinal forking.

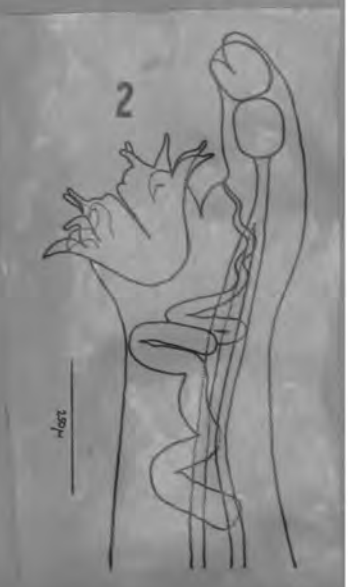
Ovary typically quadrilobate, pretesticular, in median plane between intestinal crura, and in anterior part of middle third of body. Ovary 0.063 to 0.21 mm. in its short obliquely directed antero-posterior dimension, and 0.109 to 0.231 in its longer oblique transverse dimension. Mehlis' gland preovarian. Ovary separated from anterior testis by width of ovary or less.

Vitelline glands profusely developed, follicles small and irregularly shaped, extending from ovarian region to posterior end of body. In gonadal region follicles occurring lateral to gonads, coming more closely together medially posterior to and between testes, tending to be arranged in 4 distinct longitudinal bands, 2 on each side more or less separated by intestinal crura.

Uterus preovarian, with transverse convolutions, between crura, opening into common genital atrium anterior to ventral sucker and lateral to median plane. Eggs comparatively few, large, ovoid, light golden yellowish, operculate and with knob-like thickening at other pole. Eggs 0.05 to 0.063 mm. by 0.029 to 0.042 mm.

Excretory vesicle elongated tubular, with parallel sides, reaching anteriorly to ovary, and lying dorsal to gonads and to posterior arch of intestinal crura.

*Discussion:* This species closely resembles *O. elongatus* Ozaki, 1928, but differs from that species in the presence of 2 pairs of median digitiform papillae on the acetabulum and also in the shape of the peripheral papillae.


## Opecoelus elongatus Ozaki, 1925

3.5 to 4.3 by 0.32 to 0.36. Lateral margins approximately parallel, cephalic end bluntly pointed, caudal end rounded. Acetabulum pedunculated, with finger-like papillae, 1/7 to 1/9 from anterior end, 0.29 to 0. 3 in diameter. Oral sucker 0.1 in diameter. Pharynx small, 0.08 in diameter; prepharynx very short, esophagus short, 0.11 long. Bifurcation of intestine anterior to acetabulum. Ceca slender, uniting near caudal end.

Testes irregularly lobed, tandem, separated by distance of testis diameter, in middle third. Genital pore on left side, anterior to intestinal fork. Cirrus pouch small, on antero-lateral side of intestinal fork. External seminal vesicle winding, extending some distance behind acetabulum.

Ovary 4-lobed, smaller than testes, in front of anterior testis. Shell gland anterior to ovary. Uterus with transverse coils preovarian, intercecal. Vitellaria lateral, from level of anterior end of ovary to posterior end of body, confluent behind testes. Uterine eggs 50 to 55 by 29 to 31 µ.

Excretory vesicle extending from before the ovary to caudal end.

Host: Upeneus pleurospilos Bleeker
Locality: Nagaski, Japan.

Reported from Upeneoides bensasi from the Inland Sea by Yamaguti, 1934. Yamaguti describes the processes of the acetabulum as two symmetrically situated pairs of papillae. Each papilla is divided into two short finger-like processes in which respect the species is unique. Yamaguti's measurements are slightly larger. Eggs 55 to 58 by 29 to 34 µ.

AHMAD, 1978

(b) *Paropecoelus filiformis* ~~sp. n.~~ (Figs. 3, 4)

Host : *Chirocentrus dorab* (Forskal)

Site : Small intestine

Locality : Puri coast, Orissa

Number of specimens : Seven specimens from two host of 87 examined.

Specimens deposited : NO. MT 52 (Holotype); NO MT 53 (Paratypes)

Discussion : So far 11 species of *Paropecoelus* Pritchard, 1966, have been described : *P sogandaresi* Pritchard, 1966, *P. elongatus* (Ozaki, 1925), *P. adelongatus* (Nagaty, 1954), *P. thapari* (Nagaty, 1954), *P. upenoides* (Nagaty, 1954), *P. lanceolatus* (Martin, 1960) Yamaguti, 1970, *P. palawalensis* (Fischthal & Kuntz, 1964), *P. sacculatus* Pritchard, 1966, *P. parupenei* Yamaguti, 1970, *P. indicus* Madhavi, 1975 and *P. theraponi* Gupta & Ahmad, 1976. The new form differs from all the above mentioned species in having filiform body and longer posttesticular space. In the number and arrangement of acetebular papillae the new form is most like *P. thapari* but differs from it in having vitellaria uninterrupted in testicular and ovarian zone, ovary rod-shaped and overlapping anterior testis, genital pore at intestinal bifurcation, vitellaria evtending from some distance anterior to ovary and eggs of smaller size.

Only two species viz., *P. indicus* and *P. theraponi* have been described from India. The new species differs from these two species in having specimens of larger size, four biramous acetabular papillae and apertural papillae being absent, gential pore at intestinal bifurcation, rod-shaped ovary and overlapping anterior margin of anterior testis, vitellaria extending from some distance anterior to ovary. It further differs from *P. indicus* in having testes entire and from *P. theraponi* in having eggs of larger size.


Yamaguti, 1970

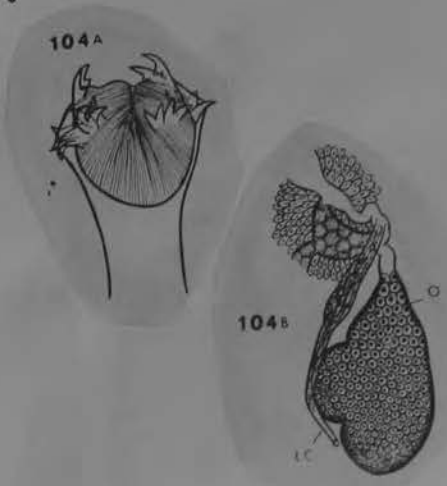
90. *Paropecoelus lanceolatus* (Martin, 1960) ~~n. comb.~~
Syn. *Opecoelus lanceolatus* Martin, 1960
(Fig. 104)

HABITAT: Intestine of *Parupeneus pleurostigma* and *P. chryserydros*; Hawaii.

DESCRIPTION (based on three completely relaxed specimens): Body slender, 1.45-5.2 × 0.1-0.27 mm. Oral sucker ventroterminal, 50-130 μ in diameter; prepharynx distinct; pharynx 40-80 μ wide; esophagus 0.1-0.15 mm long; ceca united posteriorly and opening midventrally close to posterior extremity. Acetabulum pedunculate, 0.1-0.2 mm anteroposteriorly, with six or eight horn-like tentacles on anterior and posterior borders respectively, though there are five pairs according to the original author; each of the two largest tentacles on each border bears a nodular process near its base.

Testes with or without distinct indentation on posterior margin, 0.12-0.36 × 0.05-0.22 mm. Seminal vesicle tubular, winding, 30-50 μ wide, reaching to near anterior end of vitellaria. Ovary heart-shaped, 60-170 × 40-130 μ, pre-equatorial. In one specimen the Laurer's canal, arising from the germiduct near its junction with the vitelline duct, is strongly distended with sperm throughout its length, and opens dorsal to the ovary in line with its left border. Vitellaria commencing at different levels in posterior part of anterior third of body. Mature eggs 42-48 × 32-35 μ in life.

DISCUSSION: Although the acetabular tentacles in our specimens do not agree with Martin's description, there is no doubt that they belong to *Opecoelus lanceolatus* Martin, 1960, which is now transferred to *Paropecoelus* Pritchard, 1966.



AHMAD, 1978

(c) *Paropecoelus manteri* sp.n. (Figs. 5,6)

Host : *Therapon theraps* (Cuv. and Val.)

Site : Small intestine

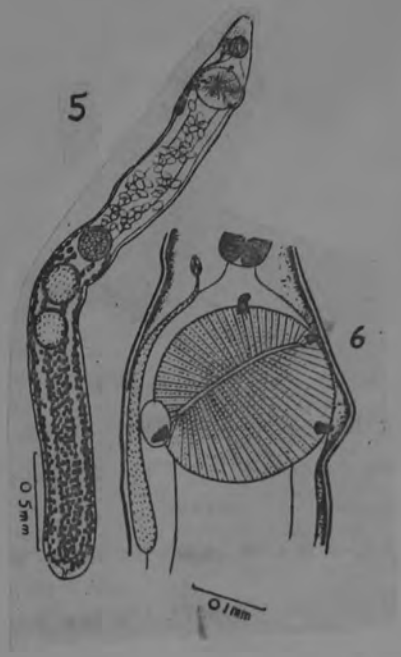
Locality : Puri coast, Orissa.

Number of specimens : Nine specimens from two hosts of 46 examined.

Specimens deposited : No. MT 54 ( Holotype ); No. MT 55 ( Paratypes )

Discussion : The new species *P. manteri* differs from all the known species of the genus *Paropecoelus* in having only four uniramous peripheral papillae. In the absence of apertural papillae the new form is most like *P. thapari* and *P. filiformis* but differs from them in having a long prepharynx, genital pore behind pharynx, testes close together, vitellaria extending from level of ovary and different sucker's ratio. It further differs from *P. thapari* in not having vitellaria interrupted in testicular and ovarian zone and from *P. filiformis* in having ovary spherical and not overlapping anterior testis, eggs of larger size and pharynx larger than oral sucker.

It differs from the two Indian species viz , *P. indicus* and *P. theraponi* in having only four uniramous peripheral papillae, genital pore behind pharynx, ovary entire, eggs of larger size and longer prepharynx. It further differs from *P. indicus* in having testes entire and longer posttesticular space and from *P. theraponi* in having shell gland complex preovarian.




Holotype and paratypes have been deposited in the museum, Shibli National College, Azamgarh, U. P.

*Opecoelus palawanensis* ~~n. sp.~~ (Figs. 1 and 2) FISCHTHAL AND KUNTZ, 1964

HOSTS: Type, *Parupeneus indicus; P. barberinus* (Mullidae).
HABITAT: Small intestine.
LOCALITY: Puerto Princesa, Palawan Island, Philippines.
DATE: 21 May 1962.
TYPES: USNM Helm. Coll. No. 37890 (one slide of type from *P. indicus*), and No. 37891 (one paratype from *P. barberinus*).

DESCRIPTION (based on five specimens, three mature ones measured and two immature not measured): Body narrow, elongate, unarmed, 2,253 by 255 (type), depth (dorsoventral extent) in two 189 to 215; forebody short, 242 to 290, narrower than hindbody; posttesticular space (type) 650; posterior extremity round. Oral sucker 70 to 80 by 68 to 82 (depth), subterminal ventral. Acetabulum 104 to 119 by 123 to 143 (depth), on short stalk, bearing four biramous papillae, one on each anterolateral and each posterolateral margin, and four simple papillae, two anteriorly between biramous papillae but more toward acetabular opening and two posteriorly in similar position, simple papillae with short process at base projecting toward acetabular opening; all papillae conical with tip round; biramous papilla, width common base 36 to 37, rami 31 to 72 by 16 to 23 (at base); simple papilla 16 to 26 by 14 to 16 at base and 7 to 9 at tip, basal process length 3 to 4. Sucker length ratio 1:1.30 to 1.56. Prepharynx short, 17 to 24; pharynx round, diameter 53 to 61; esophagus longer than prepharynx, 68 to 106; cecal bifurcation at level of anterior margin of acetabular stalk or slightly anterior. Ceca simple, uniting near posterior extremity, short tube leading to subterminal ventral anus. Excretory bladder tubular, extending forward to ovarian region; pore terminal.


Testes two, tandem, close together, both slightly lobate or anterior testis may be smooth; anterior testis 153 to 224 by 116 to 174, posterior testis (in two) 169 to 230 by 126 to 245; acetabulum to anterior testis 950 to 1,260, to posterior testis (in two) 1,330 to 1,570, distance between testes (in two) 5 to 95. Cirrus sac small, narrow, inconspicuous, 77 to 85 by 22 to 34, at level of cecal bifurcation and anterior portion of acetabular stalk, sinistral; containing muscular cirrus, small pars prostatica, prostate gland cells, and short, tubular seminal vesicle. External seminal vesicle sinuous, narrow, extending 399 to 545 postacetabular (slightly over half way to ovary), not reaching vitellaria. Genital pore left of midline at level of posterior portion of esophagus, 182 to 222 from anterior extremity.


Ovary 135 to 186 by 131 (type), depth (in two) 104 to 116, four lobed, pretesticular, in tandem with testes; acetabulum to ovary 705 to 1,030; ovary to anterior testis 7 to 95. Uterine seminal receptacle; ootype complex overlapping anterior portion of ovary dorsally. Vitelline follicles commencing 190 to 350 preovarian (one fourth to two fifths distance between ovary and acetabulum), also commencing well anterior to ovary in immature specimens, extending without interruption to posterior extremity, invading intergonadal spaces to some extent, confluent posttesticular; vitelline reservoir at anterior portion of ovary. Uterus with few coils between ovary and posterior portion of external seminal vesicle, then ascending either straight or with few slight undulations to metraterm; latter slightly longer than cirrus sac. Eggs large, yellow, operculate, with small knob at anopercular end, 10 measuring 45 to 53 by 28 to 34, younger eggs rounder.

DISCUSSION: In the key to the species of *Opecoelus* prepared by Manter (1954) *O. palawanensis* keyed to *O. tasmanicus* Crowcroft, 1947. However, the latter lacked an acetabular stalk, had five or six simple, blunt papillae on each acetabular lip, and the external seminal vesicle did not extend postacetabular. Our species appears closest to *O. adelongatus* described by Nagaty (1954) from *Upenoides vittatus* and *Mulloides auriflamma* from the Red Sea. The number and arrangement of acetabular papillae are as presented for the latter. Nagaty made no mention of a basal process on the simple papillae. Significantly, the vitellaria in all five specimens (mature and immature) of *O. palawanensis* extends well anterior to the ovary, whereas in *O. adelongatus* it extended only to the ovarian region. Of lesser significance is the round pharynx in the former, whereas it is elongate in the latter.

91. *Paropecoelus parupenei* ~~n. sp.~~ Yamaguti, 1970
(Fig. 105)

HABITAT: Intestine of *Parupeneus porphyreus* (local name "kumu"); Maui, Hawaii.

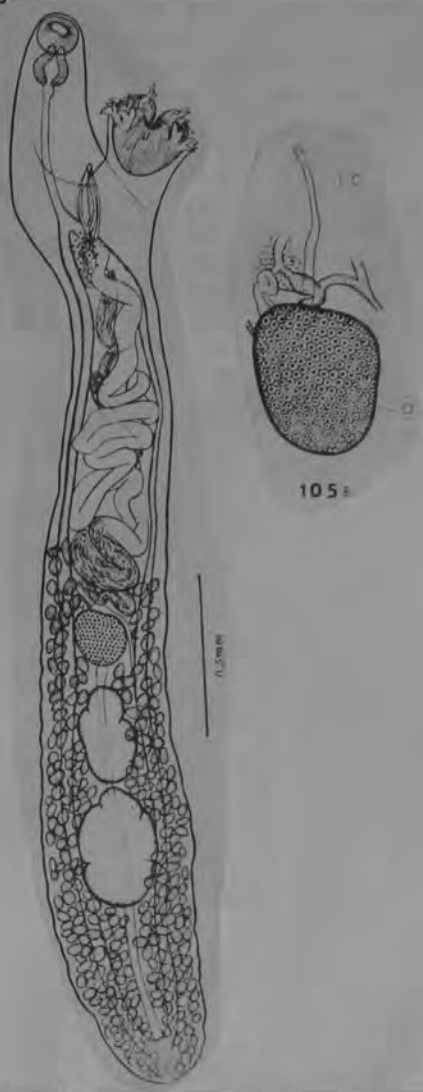
HOLOTYPE: U. S. Nat. Mus. Helm. Coll., No. 63714.

DESCRIPTION (based on 23 whole mounts): Body slender, 1.2-4.0 mm long, up to 0.17-0.52 mm wide at level of posterior testis. Oral sucker terminal, 60-130 60-170 $\mu$; prepharynx 25-50 $\mu$ long, sometimes invisible. Pharynx often contracted anteriorly and pyriform, 50-150 X 70-130 $\mu$; esophagus narrow, muscular, 0.15-0.5 mm long, bifurcating a little behind level of genital pore; ceca united posteriorly, opening ventrosubterminally by anus. Acetabulum pedunculate, 0.12-0.32 mm deep, 0.13-0.32 mm in transverse diameter, with its stalk arising just posterior to middle of anterior third of body; anterior and posterior margins each with a pair of medial and a pair of four-pronged lateral tentacles as in *Paropecoelus sogandaresi* Pritchard, 1966; each median tentacle on anterior and posterior margins with a very short branch near its base and these branches (two anterior and two posterior) are opposite each other; total number of tentacular branches 24.

Testes oval, entire or more frequently somewhat irregularly incised, median, intercecal, contiguous or a little apart one from the other, 0.06-0.4 X 0.06-0.29 mm, in posterior half of hindbody; anterior testis almost constantly at junction of middle with posterior third of body in contrast with that of *P. sogandaresi*, in which the posterior testis lies at this junction so that the posttesticular space is one-fifth to one-sixth of the body length. Seminal vesicle tubular, sinuous, 0.25-0.68 mm lineally, up to 30-100 $\mu$ wide, extending from a short distance anterior to vitellaria to posterior end of base of acetabular peduncle; its narrow, distinctly muscular, anterior portion winding. Prostatic complex and cirrus pouch fusiform, latter very poorly developed. Genital pore sinistral to posterior portion of esophagus, a little (50-100 $\mu$) anterior to level of intestinal bifurcation.

Ovary subglobular, 50-180 X 50-180 $\mu$, postequatorial. No seminal receptacle. Laurer's canal arising from germiduct just before the latter joins the vitelline duct, opening middorsally dorsal or anterior to ovary. Receptaculum seminis uterinum present. Uterus winding from side to side ventral to seminal vesicle; metraterm alongside male terminalia. Eggs oval, 46-54 X 28-35 $\mu$. Vitellaria circumcecal, extending from halfway between posterior end of seminal vesicle and ovary to posterior end of body, where they are confluent, not meeting in median line between ovary and anterior testis and between two testes; vitelline reservoir ovoid, 20-90 X 40-80 $\mu$. immediately anterior or anterolateral to ovary. Excretory vesicle tubular, middorsal, reaching to posterior end of ovary; pore terminal.

105A



105B

DISCUSSION: This species resembles *Paropecoelus sogandaresi* Pritchard, 1966 so closely – especially in the position of the ovary and anterior testis, the length of the posttesticular space, the anterior extent of vitellaria, the position of the ovary, egg size, etc. – that it might easily be confused with the latter unless a very careful comparison is made. As far as the acetabular tentacles are concerned, *Dacylostomum caballeroi* Martin, 1960 shows a similar arrangement of the tentacles, but it is different from the present species in body shape, absence of anus, presence of distinct cirrus pouch, anterior extent of vitellaria, egg size, etc. According to Pritchard, who examined the holotype of *D. caballeroi*, a relatively large accessory sucker is present ventral to the intestinal bifurcation. She suggested that it appears to represent a new genus.

Opecoelidae probably Paropecoelus

Opecoelus quadratus Ozaki 1928

Worms of small size, with cylindrical body 2.16 -2.55 long by 0.3 broad. Acetabulum with broad prominent pedicle, 0.22 in diameter, 1/5 of body length from cephalic extremity, with fingerlike papillae. Oral aperature ventro-terminal; oral sucker o,11 in diameter. Pharynx 0.09 in diameter; prepharynx quite short; esophagus o.21 long; intestinal fork at base of pedicle; ceca parrellel to sides, uniting close to caudal end. Testes ovid or slightly deformed, 0.23-0.35 by 0.15-0.2, one close behind the other, occupying the middle two fourths of the posterior half of the body. Genital fork pore on the left side, anterior to the intestinal fork. Vesicular seminalis externa winding, extending behind the acetabulum about half way onwards to the ovary. Ovary four lobed, amaller than testes, in front of the anterior testes. Shell gland anterior to the ovary. Uterus forming transverse coils between the ovary and the genital pore and between the ceca. Vitellaroa lateral, extending to the base of the acetabular pedicle, coalescing in the median line behibd the hind testes, continuous. Uterine eggs 0.050-0.052 by 0.03-0.032. Excetory a simple vessel vesicle a simple tube reaching to forwards to the shell gland; pore terminal.

Habitat. Intestine of Upeneus pleurospilos Bleeker

Locality. Nagasaki Japan .

### 89. *Paropecoelus sacculatus* Pritchard, 1966

(Fig. 103)

HABITAT: Intestine of *Parupeneus chryserydros* (local name "moano kea"); Hawaii.

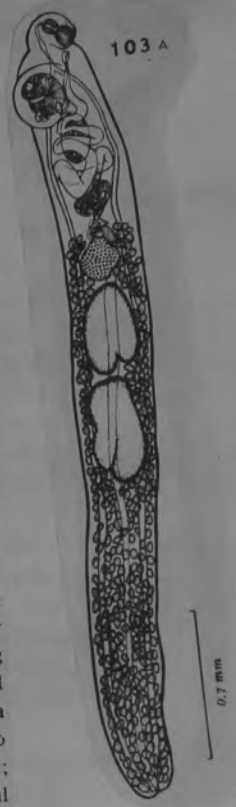
Specimens deposited in U. S. Nat. Mus. Helm. Coll., No. 63713.

DESCRIPTION (based on a single whole mount): Body elongate, subcylindrical, 3.8 × 0.4 mm; oral sucker terminal, 80 × 100 μ; prepharynx present, pharynx 60 × 60 μ; esophagus 0.15 mm long; ceca united posteriorly and opening by ventral anus close to posterior extremity. Acetabulum short-stalked, 0.18 × 0.2 mm, situated near anterior extremity, with one pair of quadrifid tentacles on outer anterior wall and similar pair on outer posterior wall, and two pairs of marginal papillae.

Testes deeply incised on posterior border in the type, 0.4-0.5 × 0.22-0.25 mm, confined to middle third of body. Seminal vesicle saccular, extending well posterior to base of acetabular stalk. Cirrus pouch very poorly developed; pars prostatica indistinct. Genital pore to left of esophagus.

Ovary trilobate, 0.22 × 0.18 mm, situated at anterior part of middle third of body. Laurer's canal opening dorsal to ootype anterior to vitelline reservoir. Collapsed eggs 44-54 × 31-39 μ in mounted condition. Vitellaria commencing at level of ovary, intruding a little into intertesticular space and confluent in posttesticular area; vitelline reservoir overlapping ovary at its anterosinistral corner. Excretory vesicle reaching ovary; pore terminal.

DISCUSSION: This species differs from *Paropecoelus parupenei* n. sp. from the related host in the relative position of the ovary and testes, in the Laurer's canal opening farther anteriorly, and in the inner marginal acetabular papilla lacking a nodular swelling. Moreover, the pars prostatica is unusually large in *P. parupenei*.




*Paropecoelus sacculatus* sp. n.
(Figs. 8—9) Pritchard, 1966

Hosts: *Parupeneus multifasciatus* (Quoy and Gaimard), moano (Mullidae), type host; 24 specimens from 11 of 29 hosts.

*P. chrysonemus* (J. and E.); 1 specimen from 24 hosts.

Location: Intestine

Holotype: No. 60350

Description (based on 10 specimens): Body 1.536 to 3.996 mm long by 335 to 592 wide at level of ovary or testes. Oral sucker 69 to 99 wide by 74 to 99 long; forebody one-sixteenth to one-seventh body length, tapering toward anterior end; acetabulum (Fig. 9) pedunculate, 154 to 201 wide by 160 to 208 long, two apertural papillae on anterior margin of aperture may interlock with two similar papillae on posterior margin; near each corner of aperture a process forks to form four papillae, making a total of 16 peripheral papillae; sucker ratio 1 : 2.0 to 2.5. Prepharynx 8 to 19 long; pharynx 42 to 64 long by 51 to 67 wide; esophagus slender, 80 to 161 long; cecal bifurcation immediately anterior to acetabular stalk, ceca joining at posterior end of body; rectum short, anus ventral and subterminal.

Testes tandem, near but not contiguous, near middle of hindbody, 214 to 489 long by 141 to 348 wide, anterior and posterior margins indented or entire testis irregularly lobed. Seminal vesicle an ovoid sac, intercecal, dextral, mostly postacetabular, beginning halfway between ovary and acetabulum, 112 to 281 long by 67 to 134 wide; followed by sinuous duct extending forward and to left. Cirrus inconspicuous, short, 32 long by 24 wide in holotype; enclosed in small, thin-walled cirrus sac. Genital pore sinistral, opposite midesophagus or sligthly more posterior.

Ovary pretesticular, trilobed with anterior projection almost as large as lobes, 134 to 208 long by 107 to 235 wide; Mehlis' gland immediately anterior to ovary; Laurer's canal present, pore on median line dorsal to ovary; uterus preovarian, intercecal, proximal coils containing sperm cells; metraterm short, inconspicuous. Vitellaria follicular, extending along ceca from ovarian level to posterior end of body, intruding between ovary and anterior testis and between testes, more or less filling posttesticular space; sometimes interrupted opposite testes and ovary on one or both sides; vitelline reservoir immediately preovarian, ovoid, 87 to 181 long by 90 to 134 wide. Eggs yellow, 46 to 56 long by 29 to 38 wide; thinner-shelled eggs near ovary, 56 to 61 by 37 to 42.

Excretory pore terminal; vesicle I-shaped, extending to level of ovary.

The name *sacculatus* refers to the shape of the seminal vesicle.

Discussion: *Paropecoelus sacculatus* is most like *P. sogandaresi* with which it is sometimes found. It differs primarily in the shape of the seminal vesicle which is ovoid and saccular rather than elongate, tubular and sinuous; also in the more distinctly trilobed ovary, the vitellaria not extending anterior to the ovary, a smaller oral sucker and therefore larger sucker ratio, and somewhat narrower eggs.

Both *Paropecoelus sacculatus* and *P. sogandaresi* seemed closely related to *Dactylostomum caballeroi* Martin, 1960, which is also from a goatfish (Mullidae) in Hawaii. Martin (1960a) observed the close resemblance between his species and the genus *Opecoelus* Ozaki, 1925, but placed it in *Dactylostomum* Woolcock, 1935, because it had a cyclocoel rather than an anus. The holotype of *D. caballeroi*, kindly loaned by Dr. John S. Garth of the Hancock Foundation, has acetabular papillae (Fig. 10a) arranged as in *Paropecoelus sacculatus* and *P. sogandaresi* (16 peripheral and 4 apertural papillae). It also has, ventral to the cecal bifurcation, a relatively large and heretofore unreported accessory sucker 80 by 61 which lacks a limiting outer membrane although it is surrounded by small gland cells. The excretory vesicle could not be determined. If some connection exists between the cyclocoel and the excretory vesicle, then the species is more or less typical of *Opecoeloides* Odhner, 1928; otherwise, it represents a new but closely related genus in which both an accessory sucker and a cyclocoel are present.


*Opecoelus thapari* n. Nagaty, 1954
Figure 5

The description of this species is based upon 8 stained and mounted specimens obtained from the alimentary tracts of 6 *Upenoides vittatus* locally called *"Enber baladi"* from Ghardaga.

*Description:* Trematodes 0.998 to 2.34 mm. in length by 0.176 to 0.318 mm. in maximum breadth near ventral sucker, sides almost parallel, and posterior end rounded. Ventral sucker larger than oral, situated at posterior border of first fifth of body, borne on short broad pedicle. Ventral sucker 0.158 to 0.189 mm. long by 0.158 to 0.265 mm. broad, breadth usually exceeding length. Processes of acetabulum, so characteristic of genus *Opecoelus* very rudimentary and in most specimens discernible with difficulty, only 8 peripheral papillae discernible and these arranged in 4 pairs, 2 antero-lateral and 2 postero-lateral.

Opening of oral sucker directed ventrally. Oral sucker 0.066 to 0.138 mm. in diameter, smaller than ventral sucker. Pharynx muscular, well-developed, partially overlapping oral sucker dorsally. Pharynx 0.044 to 0.127 mm. long by 0.04 to 0.074 mm. broad. Esophagus of medium length, divided into 2 simple intestinal branches anterior to ventral sucker. Intestinal crura situated laterally and united to form an arch at posterior end of body, discharging through a simple short canal leading to outside at posteriorly situated anal opening.

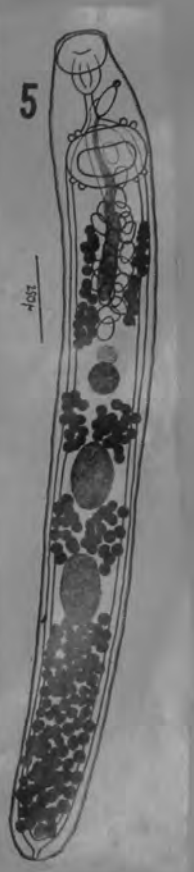
Testes 2, smooth, ovoid or spheroid, of about same size, and situated in tandem in posterior half of body in mid-plane between intestinal crura. Anterior testis situated just posterior to equator of body and measuring 0.119 to 0.223 mm. long by 0.11 to 0.167 mm. broad. Distance between testes about equalling diameter of posterior testis. Latter 0.123 to 0.254 mm. long by 0.11 to 0.154 mm. broad. Vesicula seminalis externa long, but not tortuous. Its broad posterior end lies about midway between ovary and posterior border of ventral sucker in space between crura. Gradually narrowing toward its anterior extremity it joins the small cirrus sac just anterior to intestinal bifurcation. Cirrus sac small, ovoid, at left of esophagus, opening into genital pore near posterior border of oral sucker and near left side of trematode.

Ovary spheroidal, entire, 0.062 to 0.101 mm. in diameter, pretesticular, median and slightly pre-equatorial. Mehlis' gland near and anterior to ovary. Vitelline glands well-developed, distributed between posterior end of body to posterior border of acetabulum, but vitelline fields interrupted by gonads, thus forming 4 groups. Posterior to hind testis vitelline follicles forming an uninterrupted mass mainly between intestinal crura which may be overlapped by a few follicles dorsally or ventrally. Anterior to posterior testis follicles becoming distinctly massed into 2 groups, mainly between intestinal crura with a median space free from follicles.

Uterus preovarian, occupying intercrural space, and opening into common genital atrium, lateral to esophagus. Eggs few, large, ovoid, 0.066 to 0.07 mm. by 0.035 to 0.048 mm., operculate and with slight thickening of shell at other pole.

*Discussion:* This species is closest to *O. adsphaericus* Manter and Van Cleave, 1951, from which it can be differentiated by its smaller size, its acetabulum with 4 pairs of papillae instead of 3, vesicula seminalis not sinuous and longer, ovary entire not trilobed, eggs large and fewer.

I have pleasure in naming this species after Professor G. S. Thapar of Lucknow, India.



*Opecoelus upenoidis* n. sp. Nagaty, 1954

Figure 4

Nine specimens of this species were obtained from the alimentary tracts of 6 *Upenoides vittatus* locally called "Enber baladi" from Ghardaga. This species occurred in a mixed infection with *O. adelongatus* and was first looked upon as an aberrant form of that trematode. It was thought advisable, however, to separate the 2 forms as the differences in morphology, especially the shape of the ovary and testes, which are here entire, warrant this separation. The name *O. upenoidis* is suggested for this form.

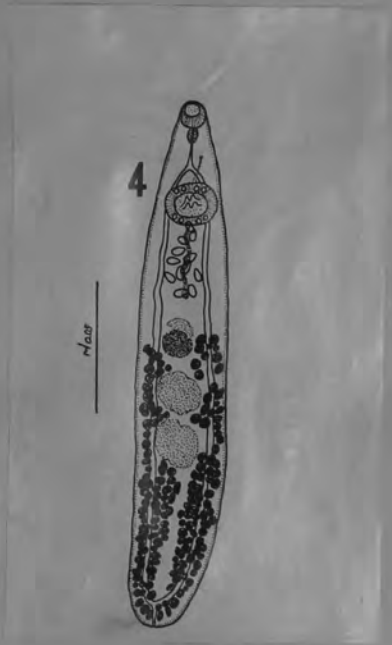
*Description:* Trematodes spatulate, tapering gradually towards oral sucker, rounded posteriorly, length 1.424 to 2.398 mm. by 0.131 to 0.315 mm. in maximum breadth at level of testes. Cuticle lacking scales or spines. Acetabulum larger than oral sucker, its width often exceeding its length of 0.108 to 0.158 mm. Acetabulum set on short stalk, and provided with 4 pairs of reduced peripheral papillae and 2 pairs median.

Digestive system similar to that of *O. adelongatus*. Oral sucker 0.088 to 0.106 mm. in diameter, pharynx muscular, 0.06 to 0.088 mm. long by 0.042 to 0.07 mm. broad.

Testes 2, tandem, almost entire, separated by short space, intercrural and situated in third quarter of body, slightly more posterior than in *O. adelongatus*. Testes subequal, 0.095 to 0.147 mm. in diameter. Vesicula seminalis externa long, slightly tortuous, and extending about two thirds distance between posterior border of acetabulum and anterior border of ovary. Cirrus sac and genital opening poorly developed and lateral to esophagus.

Ovary almost entire, crescentic or triangular, sometimes provided with small indistinct lobe, and situated at posterior-most part of anterior half of body. Diameter of ovary 0.063 to 0.088 mm. Vitelline follicles distributed along intestinal crura posterior to ovary and less profusely developed than in *O. adelongatus*. Eggs few, ovoid with smooth shells, measuring 0.053 to 0.063 by 0.028 by 0.046 mm.

*Discussion:* This species resembles closely *O. adelongatus* from which it differs in having almost entire gonads, testes situated further posterior, and vitelline follicles less profusely developed.



PARODECOELUS

*Parvacreadium* Manter, 1940

Generic diagnosis. — Allocreadiidae, Opecoelinae: Body small, broadened posteriorly, unarmed. Oral sucker subterminal, followed by prepharynx. Pharynx well developed. Esophagus short. Ceca reaching almost to posterior extremity. Acetabulum pre-equatorial, with large anterior and posterior lobes overlapping each other to cover acetabular aperture. Testes tandem, close together, in posterior half of body. Seminal vesicle free in parenchyma, at anterior border of acetabulum or overlapping it. Cirrus pouch rudimentary, enclosing a few gland cells and weakly developed cirrus. Short genital sinus present. Genital pore left of pharynx or esophagus. Ovary to the right, immediately pretesticular. No seminal receptacle. Laurer's canal present but apparently not opening outside. Vitellaria from intestinal bifurcation to posterior end of body, surrounding ceca in hindbody. Uterus pre-ovarian, eggs without polar filament. Excretory vesicle tubular, reaching to posterior testis. Parasitic in intestine of marine fishes.

Genotype: *P. bifidum* Manter, 1940 (Pl. 32, Fig. 422), in a goby; James Island, Galapagos.

### *Parvacreadium* Manter, 1940

Generic diagnosis. — Allocreadiidae, Opecoelinae: Body small, broadened posteriorly, unarmed. Oral sucker subterminal, followed by prepharynx. Pharynx well developed. Esophagus short. Ceca reaching almost to posterior extremity. Acetabulum pre-equatorial, with large anterior and posterior lobes overlapping each other to cover acetabular aperture. Testes tandem, close together, in posterior half of body. Seminal vesicle free in parenchyma, at anterior border of acetabulum or overlapping it. Cirrus pouch rudimentary, enclosing a few gland cells and weakly developed cirrus. Short genital sinus present. Genital pore left of pharynx or esophagus. Ovary to the right, immediately pretesticular. No seminal receptacle. Laurer's canal present but apparently not opening outside. Vitellaria from intestinal bifurcation to posterior end of body, surrounding ceca in hindbody. Uterus pre-ovarian, eggs without polar filament. Excretory vesicle tubular, reaching to posterior testis. Parasitic in intestine of marine fishes.

Genotype: *P. bifidum* Manter, 1940 (Pl. 32, Fig. 422), in a goby; James Island, Galapagos.

## GENERIC DIAGNOSIS OF PARVACREADIUM MANTER, 1940

Allocreadiinae of small size, with smooth skin. Acetabulum with a single large anterior and a similar posterior lobe. Posterior end broad and truncated, usually bilobed, or of very irregular contour. Prepharynx with internal thickening. Genital pore near pharynx. Seminal vesicle coiled, not reaching posterior to acetabulum. Genital sinus very short. Cirrus sac rudimentary. Cirrus weak. Seminal receptacle lacking. Type species: *Parvacreadium bifidum*.

The generic name is from *parva* (= small) and *creadium* and indicates a small, creadium-like trematode. The specific name *bifidum* indicates the bifid posterior end.

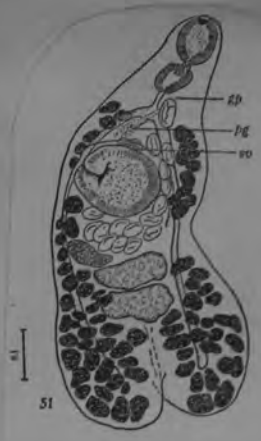
*Discussion.* Because the cirrus sac of this trematode is so inconspicuous, the genus might be thought related to the Anallocreadiinae. Actually, it differs from that subfamily in lacking body spines and a seminal receptacle as well as in the presence of a delicate but definite cirrus sac. Parvacreadium is probably most closely related to Cymbephallus Linton, 1934. Cymbephallus also has a very weak and small cirrus sac, a smooth cuticula, and, like Parvacreadium, a uterine seminal receptacle. Furthermore, certain Cymbephallus species possess acetabular processes. Parvacreadium differs from Cymbephallus in shape of the body, small size, the large acetabular lobes, the far anterior seminal vesicle, and reduced cirrus.

FROM: ALLAN HANCOCK PACIFIC EXPEDITIONS, VOL. 2, No. 14

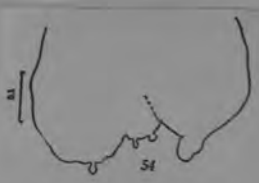
**Parvacreadium bifidum, new genus, new species** MANTER, 1940

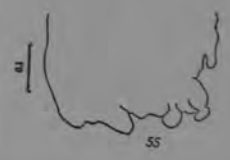
(Plate 38, figs. 51-55)

Host: Identified only as a goby
Location: Intestine
Locality: James Island, Galapagos
Number: 5 specimens from a single host






SPECIFIC DIAGNOSIS OF PARVACREADIUM BIFIDUM

Body smooth, widest at posterior end, tapering from posterior to anterior end, more rapidly so anterior to acetabulum; posterior end truncated and deeply indented medianly to form 2 rounded lobes, right and left. These lobes may bear peculiar papillalike or fingerlike processes (seen on 2 specimens) (figs. 54 and 55). Body 0.817 to 0.953 in length by 0.360 to 0.450 in greatest width. Forebody narrow and thinner than remainder of body. Oral sucker subterminal, elongated, 0.076 to 0.099 in transverse diameter by 0.085 to 0.110 in length; acetabulum proper nearly circular, 0.127 to 0.178 in diameter, possessing a single large anterior lobe and a single large posterior lobe overlapping each other to cover the acetabular aperture (fig. 52). Edges of lobes with very thick cuticula; free edge of posterior lobe extending diagonally backward and outward beyond acetabulum (fig. 52). These large, peculiar acetabular lobes seem to have a grasping function.

Prepharynx possessing an inner circular fold forming a circular ridge, almost or quite meeting in the center (fig. 53); pharynx 0.060 to 0.071 long, 0.048 to 0.066 wide; esophagus somewhat shorter than pharynx; intestinal bifurcation about ⅔ from anterior end of body to acetabulum; ceca reaching almost to posterior end, ending blindly. Genital pore slightly to the left, opposite base of pharynx or as far forward as mid-pharynx level. Testes tandem, close together, in posterior half of body, wider than long, slightly irregular in outline. Seminal vesicle slightly coiled, free in parenchyma, at anterior border of acetabulum which it may overlap a short distance; ejaculatory tube nonmuscular, almost straight, uniting with uterus near genital pore; genital sinus very short, thick walled; few prostatic cells scattered in region of ejaculatory tube and also near end of uterus. A delicate, rudimentary cirrus sac, continuous with the wall of the sinus, extends a very short distance backward enclosing a few gland cells and a weakly developed cirrus (cirrus sac observed only in sections).

Ovary transversely ovoid, pretesticular, to the right, close to anterior testis; seminal receptacle lacking; Laurer's canal present but apparently not opening to outside; vitellaria from intestinal bifurcation to posterior end of body, surrounding ceca in hindbody; uterus preovarian; eggs large and thin shelled, 51 to 59 by 30 to 34 μ. Excretory pore median, terminal, between posterior lobes of body; excretory vesicle narrow, extending to posterior testis.

FROM: ALLAN HANCOCK PACIFIC EXPEDITIONS, Vol. 2, No. 14

PARVACREADIUM

### *Pedunculotrema* gen. n.

DIAGNOSIS: Opecoelidae. Body small, unspined. Oral sucker subterminal ventral to nearly terminal. Postoral circular muscle ring present. Acetabulum larger than oral sucker, stalked, preequatorial. Prepharynx and esophagus short. Pharynx well developed. Ceca extending to near posterior extremity. Testes oblique, in middle to posterior part of hindbody, anterior testis submedian, posterior testis median, contiguous, levels overlapping. Cirrus sac long, bipartite, commencing postacetabular, containing tripartite seminal vesicle, pars prostatica, and protrusible cirrus. Genital pore sinistral, at posterior pharyngeal or anterior esophageal level. Ovary smooth, opposite anterior testis, smaller than either testis. Seminal receptacle present. Uterus mostly intercecal, usually overlapping anterior part of anterior testis, sometimes ovary. Vitellaria follicular, commencing at level of cecal bifurcation, acetabulum or postacetabularly, filling posttesticular space, lateral anteriorly, confluent dorsally throughout length of fields. Eggs large, operculate. Excretory bladder unbranched, tubular, extending to ovary-anterior testis level. Parasitic in marine fishes.

TYPE SPECIES: *Pedunculotrema ghanensis* sp. n.

DISCUSSION: This new genus appears closest to *Plagioporus* Stafford, 1904, and *Pseudoplagioporus* Yamaguti, 1938, but differs significantly in having the acetabulum stalked. It also appears close to *Podocotyloides* Yamaguti, 1934, as emended by Pritchard (1966a), but differs significantly in having a postoral muscle ring, diagonal testes with their levels overlapping, the seminal vesicle tripartite, and the ovary opposite the anterior testis. The name *Pedunculotrema* is from *pedunculus*, stalk, and *trema*, hole, referring to the presence of a stalk bearing the acetabulum.

***Pedunculotrema ghanensis* sp. n.**
**(Figs. 9–10, 19)**

HOST: *Gerres melanopterus* Bleeker, mojarra (Liognathidae).

HABITAT: Small intestine.

LOCALITY: Cape Coast, Ghana.

DATE: 12 January 1966.

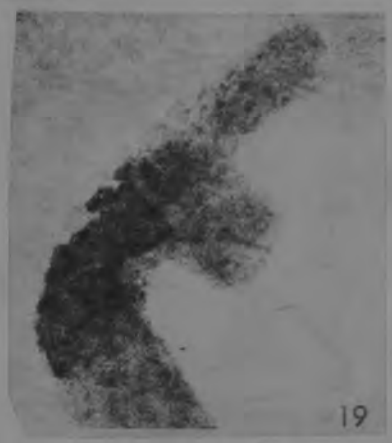
SPECIMENS: USNM Helm. Coll. No. 70675 (holotype); No. 70676 (paratype).

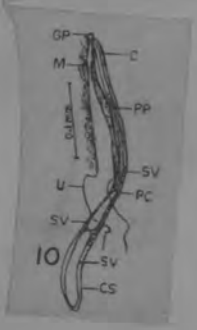
DIAGNOSIS (based on three adults from one of two fish examined; one worm mounted in ventral view and two in lateral view so that measurements are length by width by depth): Body elongate, narrow, unspined, extremities round, with body fold around acetabulum in ventral view, with short stalk bearing acetabulum in lateral view; 1,176–1,411 long, widest at acetabular level. Forebody conical, 197–242 long; hindbody 860–1,035 by 185 by 111; forebody–hindbody length ratio 1:4.3–4.4. Oral sucker subterminal ventral, nearly round, 76–100 by 82 by 104; acetabulum nearly round, aperture a transverse slit, without papillae, 121–134 by 129 by 128. Sucker length ratio 1:1.34–1.39, width ratio 1:1.57. Postoral circular muscle ring narrow. Prepharynx 17–24 long; pharynx round to longitudinally elongate, 61–87 by 58 by 68; esophagus 53–73 long; cecal bifurcation at anterior margin of acetabulum; ceca terminating blindly 84–127 from posterior extremity.

Testes two, diagonal, longitudinally elongate, contiguous, levels overlapping, overlapping ceca ventrally, occupying middle half of hindbody; anterior testis sinistromedian, constricted at ovarian level in two worms, smooth, 222–310 by 124 by 138–147, lying 177–195 postacetabular; posterior testis smooth, oval, anterior end blunt pointed, median, 213–310 by 145 by 145–148, lying 425–435 postacetabular; posttesticular space 208–290 long. Cirrus sac sinuous, bipartite, posterior part saccular, anterior part tubular, commencing dextromedianly 120–188 postacetabular, latter representing 68–97 per cent of distance between acetabulum and anterior testis and 51–74 per cent of distance between acetabulum and ovary. Seminal vesicle tripartite; saccular part of cirrus sac containing two saccular parts terminating dorsal to acetabulum, posterior sac 85–132 by 32 by 43, anterior sac 72–124 by 23 by 39; remainder of seminal vesicle tubular, sinuous. Pars prostatica short, at anterior margin of acetabulum. Cirrus muscular. Genital pore sinistral, at posteroventral part of pharynx or just lateral to it.

Ovary smooth, dextral to midlength of anterior testis, longitudinally oval, 104–133 by 77 by 80–99, lying 233–255 postacetabular and 56–60 posterior to level of anterior margin of anterior testis. Oötype complex anteromedian to ovary. Seminal receptacle large, median, longitudinally elongate, overlapping anteromedian parts of ovary and anterior testis dorsally, entering uterine field, 100–133 by 65 by 56–62. Uterus relatively short, coils few, preovarian, overlapping anterior part of anterior testis. Metraterm long, slightly muscular, surrounded by gland cells, commencing dorsal to acetabulum. Vitelline follicles large, smooth, commencing at cecal bifurcation, filling posttesticular space, lateral anteriorly, confluent dorsally throughout length of fields. Eggs large, yellow-brown, operculate, partially collapsed, five measuring 58–60 by 31–38.

Excretory bladder unbranched, tubular, extending anteriorly to ovary-anterior testis level; pore terminal.

***Pedunculotrema capecoastensis*** **sp. n.**
**(Figs. 11–12, 20)**

HOST: *Pomadasys jubelini* (Cuvier and Valenciennes), burro (Pomadasyidae).

HABITAT: Small intestine.

LOCALITY: Cape Coast, Ghana.

DATE: 25 March 1966.

SPECIMENS: USNM Helm. Coll. No. 70677 (holotype); No. 70678 (paratypes).

DIAGNOSIS (based on five adults from one of seven fish examined; measurements are length by width by depth): Body elongate, narrow, unspined, anterior extremity nearly truncate, posterior round, with body fold around acetabulum in ventral view, with stalk (190–218 long, 145–190 wide) bearing acetabulum in lateral view, 830–1,075 long, widest at acetabular level. Forebody narrowing slightly anteriorly, 165–220 long; hindbody 602–674 by 200–220 by 215–245; forebody–hindbody length ratio 1:3.1–3.8. Oral sucker terminal or nearly so, transversely elongate, truncate posteriorly, 73–102 by 93 by 91–105; acetabulum longitudinally elongate, aperture a transverse slit, without papillae, 145–160 by 151 by 134–150. Sucker length ratio 1:1.54–2.19. Postoral circular muscle ring narrow. Prepharynx short, up to 15 long; pharynx longer than oral sucker, oval, 92–126 by 75 by 70–78; esophagus short, up to 21 long; cecal bifurcation at acetabular level or slightly preacetabular; ceca terminating blindly 53–108 from posterior extremity.

Testes two, smooth, diagonal, longitudinally elongate, contiguous, sometimes overlapping, overlapping ceca ventrally, extending posteriorly from midlength of hindbody; anterior testis sinistromedian, 165–184 by 131 by 105–140, lying 170–234 postacetabular; posterior testis median, 181–247 by 122 by 105–169, lying 270–380 postacetabular; posttesticular space 98–160 long. Cirrus sac bipartite, posterior part saccular, anterior part tubular, sinuous, latter part with posterior loop or simple shallow U-shaped bend at acetabular level or just postacetabular, commencing 117–238 postacetabular. Seminal vesicle tripartite; saccular part of cirrus sac containing two saccular parts of seminal vesicle, posterior sac 123–169 by 38–41 by 34–39; remainder of seminal vesicle tubular, sinuous. Pars prostatica relatively long, lying dorsal to acetabulum, may extend preacetabularly. Cirrus muscular, shorter than pars prostatica. Genital pore sinistral to posterior part of pharynx or anterior part of esophagus.

Ovary smooth, dextral to and contiguous with anterior testis, usually separated from posterior testis but may be contiguous with it, longitudinally elongate, 70–87 by 53–56 by 68–75, lying 185–270 postacetabular, 15–70 posterior to level of anterior margin of anterior testis. Ootype complex dorsomedian to ovary and anterior testis. Seminal receptacle large, dorsal or dorsomedian to ovary, may overlap anterior testis dorsally, longitudinally elongate, 70–133 by 48 by 59–63. Uterus relatively short, entirely preovarian to slightly overlapping latter, may overlap anterior part of anterior testis. Metraterm short, slightly muscular. Vitelline follicles large, smooth, commencing 20–123 postacetabular, filling posttesticular space, lateral anteriorly, confluent dorsally throughout length of fields. Eggs large, yellow-brown, operculate, partially collapsed, six measuring 53–59 by 29–33.

Excretory bladder unbranched, tubular, extending anteriorly to ovary-anterior testis level; pore subterminal dorsal.

DISCUSSION: This new species differs from *P. ghanensis* in the shape of the oral sucker, relative size of the pharynx, and the anterior limits of the vitellaria being postacetabular.



PEDUNCULOTREMA

Montgomery, 1957

**Pellamyzon sebastodis** n. gen., n. sp.
(Figs. 8–11)

Description (based on 17 specimens; measurements on eight): Body smooth, tapering to bluntly rounded ends; 3.19–5.64 mm. long, 0.72–0.86 mm. wide; forebody 0.49–0.89 mm. long; post-testicular length 0.92–1.47 mm., longer than forebody; oral sucker 0.26–0.34 mm. long, 0.28–0.32 mm. wide; acetabulum protrusible, conical, tapering toward its posterior edge, without papillae, 0.67–0.87 mm. long, 0.53–0.74 mm. wide, aperture directed anteriorly; sucker ratio 1: 1.77–2.32; pharynx cylindrical, 0.20–0.30 mm. long, 0.18–0.20 mm. wide; esophagus nearly as long as pharynx; intestinal bifurcation dorsal to anterior border of acetabulum; each cecum ending in anus (Fig. 9) at posterior end of body; ani lateral to excretory pore.

Genital pore to left of middle of pharynx; gonads tandem, in posterior half of body; testes oval, separated by vitellaria; cirrus sac sinuous, ending 0.07–0.25 mm. posterior to acetabulum depending on state of extension, containing seminal vesicle, *pars prostatica* without prostatic gland cells, and cirrus (Fig. 11).

Ovary trilobed, immediately anterior and sometimes contiguous with anterior testis (Fig. 10); seminal receptacle present, dorsal to ovary; opening of Laurer's canal sinistral, dorsal, immediately anterior to ovary; vitelline follicles in lateral fields from region of acetabulum to posterior end of body; vitelline follicles confluent anterior to ovary, between testes, and posterior to testes, sometimes interrupted opposite ovary or testes; uterine coils anterior to ovary; eggs 52 $\mu$–70 $\mu$ × 31 $\mu$–42 $\mu$. Excretory vesicle extending to level of ovary (Fig. 9).

The description given above is for specimens from *Sebastodes serriceps*, the type host. Specimens from *Sebastodes atrovirens* were considerably larger, measuring as follows: Body 5.7–6.83 mm. long, 0.89–1.06 mm. wide; forebody 0.51–0.63 mm. long; post-testicular length 1.45–1.73 mm.; oral sucker 0.30–0.40 mm. long, 0.30–0.34 mm. wide; acetabulum 0.69–1.12 mm. long, 0.70–0.99 mm. wide; sucker ratio 1: 2.33–3; pharynx 0.20–0.24 mm. long, 0.17–0.20 mm. wide; vitellaria interrupted lateral to ovary and sometimes lateral to testes. All other characters are similar to those of specimens from *S. serriceps*.

Hosts: *Sebastodes serriceps* (Jordan & Gilbert). Treefish, (Scorpaenidae), type host. *Sebastodes atrovirens* (Jordan & Gilbert). Kelp rockfish, (Scorpaenidae).

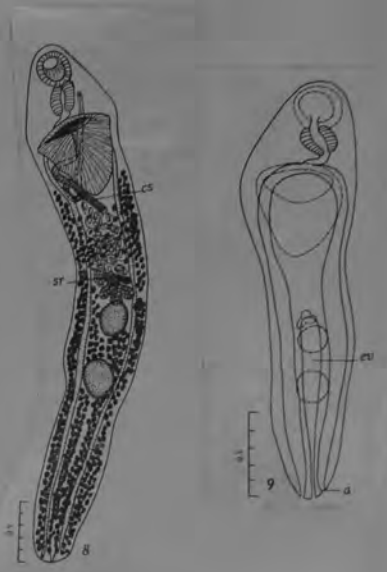
Location: Intestine.

Holotype: U. S. National Museum Helminthological Collection No. 38187.

Generic diagnosis of *Pellamyzon*: Opecoelidae. Body smooth, elongate; oral sucker subterminal; acetabulum conical, tapering posteriorly, protrusible, without papillae; esophagus bifurcating dorsal to acetabulum, ceca extending to posterior end of body, ending in two ani; genital pore opening to left of pharynx; gonads tandem near midbody; cirrus sac extending sinuously posterior to acetabulum, containing seminal vesicle, *pars prostatica* without gland cells, cirrus; ovary pretesticular, trilobed; seminal receptacle present; uterus preovarian; Laurer's canal present; vitellaria from region of acetabulum to posterior end of body; eggs approximately 60 $\mu$ long; excretory vesicle tubular.

Discussion: *Pellamyzon* is probably related to *Podocotyle* (Dujardin, 1845), with which it agrees in possessing an unarmed body, tandem testes, long cirrus sac, no external seminal vesicle, a trilobed ovary, seminal receptacle, Laurer's canal, vitellaria in hindbody, and excretory vesicle extending to ovary. It differs from *Podocotyle* mainly in having a large conical acetabulum and two ani.

The name *Pellamyzon* is from the Greek words *pella* (bowl) and *myzo* (to suck), referring to the large conical acetabulum. The specific name *sebastodis* refers to the host.





DELLAMYZON

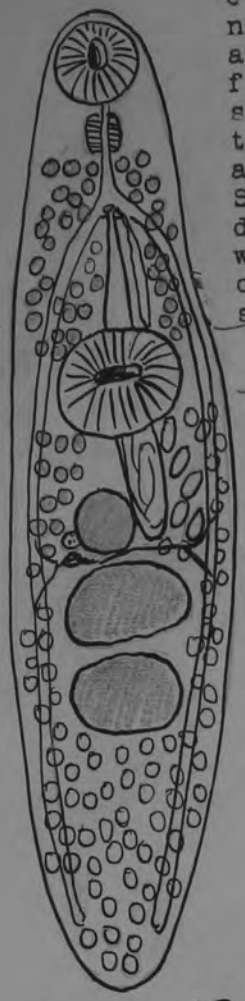
PERACREADIUM Nicoll, 1909

According to Nicoll, 1910 this genus is like Allocreadium except in the enormous development of the cirrus sac and in the extensive development of the vitellaria.

Type of allocreadium ?

Small to medium-sized Allocreadiinae, with elongated ovate, slightly flattened body. Acetabul not very prominent, situated about the end of the anterior third of the body. Esophagus short, bifurcation midway between suckers. Excretory vesicle simple. Genital pore median, at intestinal bifurcation. Cirrus sac very long and slender, extending as far back as the ovary ( :: about 1/3 body length). Seminal vesicle convoluted; ejaculatory duct long; distinct pars prostatica present. Ovary globular, with entire margin, situated a little to the right of midline immediately in front of the testes or separated from them by a small part of the uterus. Testes usually transversly oval with entire margin, situated about the middle of the post-acetabular region. Yolk glands extensive, occupying considerable part of the neck and filling up posterior part of body. Ova without filaments, variable in size, 70 to 100 by 30 to 60 μ.

note



P. genu (Rud.)
from Odhner, 1901

Type species: P.genu (Rud.)

Other species: P.commune (Rud.)

P. peresi Mathias, 1926

vitellaria interrupted opposite acetabulum

Opecoelidae

From Durio & Manter, 1968

### *PERACREADIUM* NICOLL, 1909 AND RELATED GENERA

Three genera of opecoelids with median genital pore are closely related: *Peracreadium* Nicoll, 1909; *Cainocreadium* Nicoll, 1909; and *Cainocreadoides* Nagaty, 1956. They are easily confused with *Hamacreadium* Linton, 1910 and *Plagioporus* Stafford, 1904, but these latter two genera have genital pores to the left.

Yamaguti (1958) listed *Peracreadium* as a synonym of *Cainocreadium*. We propose to retain *Peracreadium* on the basis of its unlobed ovary. It contains the following species: *P. genu* (Rud., 1819) Nicoll, 1909, type species; *P. mycteropercae* (Sogandares-Bernal, 1959) Pritchard, 1966; and *P. perezi* Mathias, 1926.

It is more difficult to separate *Cainocreadium* and *Cainocreadoides*. The lobes of the ovary, in different species, vary from three to five to many. *Cainocreadium labracis* (Duj., 1845) Nicoll, 1909, type of the genus, has directly tandem testes whereas the testes are distinctly diagonal in species of *Cainocreadoides*. This character seems hardly of generic value, especially as two species in the genus *Peracreadium* show an intermediate condition. Thus, we consider *Cainocreadoides* Nagaty, 1956, a synonym of *Cainocreadium*.

Examination of numerous Caribbean specimens of *Hamacreadium* species leads to the conclusion that all those with a median genital pore should be placed in the genus *Cainocreadium*. Thus interpreted, the genus *Cainocreadium* contains the following species:

1. *Cainocreadium labracis* (Duj., 1845) Nicoll, 1909.
2. *C. serrani* (Nagaty, 1956) Manter, 1963. Manter (1963, p. 109) used this combination (*Cainocreadium serrani*) accidentally when *Cainocreadioides serrani* was intended. The above synonymy makes the published name correct.
3. *C. pteroisi* (Nagaty and Abdel Aal, 1962) comb. n.
   Synonym: *Hamacreadium p.* Nagaty and Abdel Aal, 1962.
4. *C. epinepheli* (Yamaguti, 1934) comb. n.
   Synonyms: *Hamacreadium e.* Yam., 1934; *Cainocreadoides e.* (Yam., 1934) Nagaty, 1956.
5. *C. gulella* (Linton, 1910) comb. n.
   Synonym: *Hamacreadium g.* Linton, 1910.
6. *C. longisaccum* (Siddiqi and Cable, 1960) comb. n.
   Synonym: *Hamacreadium l.* Siddiqi and Cable, 1960.
7. *C. lintoni* (Siddiqi and Cable, 1960) comb. n.
   Synonym: *Hamacreadium l.* Siddiqi and Cable, 1960.

Yamaguti (1958) included *Allocreadium pseudotritoni* Rankin, 1937 in the genus *Cainocreadium*, but the posterior extent of the uterus indicates that *Allocreadium* is its correct genus.

*Cainocreadium skrjabini* Layman, 1930 cannot be in the genus because of its nonmedian genital pore and extent of vitellaria. The spined body indicates the family Lepocreadiidae. However, it does not seem congeneric with *Lepidauchen* in which it was placed by Yamaguti (1958). Its status at present remains uncertain.

Allocreadiidae

Peracreadium commune (Olsson, 1868) Nicoll, 1909

*Allocreadium genus* (Rudolphi 1819)

La longueur de ce Trématode varie de 1,8 à 2,5$^{mm}$ ; sa largeur de 0,5 à 0,7$^{mm}$. L'individu représenté par la figure 7 est partiellement rétracté.

(715)

— 10 —

Le diamètre de la ventouse orale atteint 180 μ, celui de la ventouse ventrale 300 μ. Le pharynx est robuste, (110 × 110 μ) ; l'œsophage qui lui fait suite mesure 100 à 110 μ. Les branches intestinales s'étendent de chaque côté du corps, jusqu'à peu de distance de son extrémité.

Fig. 7. — *Allocreadium genus* (Rudolphi) (vue dorsale). Intestin seulement de *Labrus merula* L.

Les deux testicules sont ovoïdes, à bords entiers, à grand axe transversal ; ils sont situés l'un au devant de l'autre, vers le début du troisième tiers du parasite ; dimensions moyennes : 350 × 110 μ. La poche du cirre est très développée, longue de 700 μ. Le pore génital s'ouvre à la hauteur de la bifurcation des branches intestinales.

L'ovaire, arrondi ou piriforme, à bord entier, est placé devant le testicule antérieur ; il mesure 180 μ × 105 μ. Les vitellogènes sont formés d'un grand nombre de follicules d'environ 40 μ de diamètre qui remplissent les côtés du corps depuis la hauteur du pharynx jusqu'à l'extrémité postérieure. Les œufs, peu nombreux, sont ovales et de grandes dimensions ; ils mesurent 72 μ × 44 μ.

Habitat. — J'ai trouvé très fréquemment cette espèce dans l'intestin de *Labrus merula* L. (20 à 30 parasites par hôte) je l'ai trouvée également, mais moins régulièrement chez *Labrus turdus* L.

Peracreadium?

see Nicoll 1909

From Timon-David 1937

Acc. to Guiart (1938) this specimen is P. commune because in P. genus, the vitellaria are interrupted opposite the acetabulum.

Peracreadium genu (Rud.1819), Nicoll, 1909

The following description is by Nicoll, but he refers to Odhner 1902:497-9 as the best description.

Host: Labrus berggylta

Average length 2. mm. , width 0.6 mm.
Oral sucker: 0.2 mm.
Ventral sucker: 0.32 by 0.35, 0.8 mm. from anterior end
Pre-pharynx very short, pharynx round, ceca to posterior end.
Excretory vesicle simple to the level of the anterior border of the anterior testis.
Genital pore median, at level of intestinal bifurcation.
Cirrus sac extends back to level of ovary, thickness almost uniform. Containing convoluted sem. ves.
Testes in posterior third, post-testicular space 2/9 body length. Testes tandem, contiguous, transverse oval.
Ovary in front of anterior testis, to the right, globular.
Seminal receptacle large, behind and dorsal to ovary.
Yolk glands fill post-testicular space and the lateral margins of the body as far foward as posterior border of ventral sucker. At level of ventral sucker they are absent, but again becme voluminous in neck, extending to posterior border of pharynx.
Uterus short, neber more than 30 ova.
Eggs 80-88 by 44-56 μ

Peracreadium commune (Olsson 1868) Nicoll, 1909

Host: Labrus berggylta (only host)

Differs from P. genu in that: 1. Pharynx is fusiform
2. Esophagus only about half the length of pharynx.
3. Yolk glands not interrupted at ventral sucker.

Odhner says ova are narrower but Nicoll could not see this.

Peracreadium genu (Rud.,1819) Nicoll,1909

1° **Peracreadium genu** (Rudolphi 1819) Nicoll 1909.

Trématode parasite de l'intestin du *Labrus festivus*.

Le tube n° 2 renferme deux Distomes provenant de l'intestin d'un des Labres ; ils mesurent 2mm de longueur sur 0mm 5 de largeur. Ils répondent à l'espèce **Peracreadium genu** (Fig. 1).

Fig. 1. — *Peracreadium genu* (Rud.) Nicoll 1909 de l'intestin de *Labrus festivus*. — G.

Ce parasite fut rencontré pour la première fois par Rudolphi, à Naples, dans l'intestin d'un *Labrus luscus* et il le décrivit en 1819 sous le nom de *Distoma genu*. En 1876 seulement Olsson décrit une espèce voisine le *Distomum commune* dans l'intestin d'un Labre des côtes de Norvège. En 1901 Odhner le fait rentrer tous deux dans le genre *Allocreadium*, créé par Looss l'année précédente. Enfin en 1909, Nicoll précise les différences existant entre les deux espèces et il les fait rentrer dans le genre *Peracreadium*, créé par lui l'année précédente.

Le corps est de forme allongée, la ventouse buccale est [illegible] l'extrémité antérieure [illegible] latéralement [illegible] elle est [illegible] allongée dans le sens transversal et deux fois plus volumineuse que la ventouse buccale. Le pore génital est situé en avant de l'*acetabulum*.

Dans la moitié postérieure du corps se voient deux volumineux testicules, allongés transversalement, et en avant d'eux et à gauche se trouve l'ovaire, de forme arrondie. La poche du cirre, extrêmement longue, commence au pore génital, contourne l'*acetabulum* à gauche et s'étend jusque un peu en avant des testicules ; elle renferme une longue vésicule séminale sinueuse. Les glandes vitellogènes sont constituées par de volumineux follicules, réunis en deux masses occupant l'une la région comprise entre le pharynx et l'*acetabulum*, l'autre la région postérieure du corps. Le manque de glandes vitellogènes sur les côtés de l'*acetabulum* constituerait, d'après Nicoll, la caractéristique du *Peracreadium genu* ; le parasite décrit par Timon-David, en 1937, dans l'intestin des *Labrus merula* du golfe de Marseille, serait dans ce cas un *Peracreadium commune*. L'utérus, très court, ne renfermerait qu'un très petit nombre d'œufs.

Il est peu vraisemblable que cette espèce soit pathogène, à moins qu'elle ne se trouve en grand nombre dans l'intestin. Il ne faut pas oublier en effet que les Douves se nourrissent de sang et que par conséquent elles peuvent devenir des agents de l'inoculation.

Peracreadium gasterostei Bovien, 1932

host: Gasterosteus aculeatus, intestine
locality: brook near Højvig (Strømø), The Faroes

size: 0.8 - 1.28 long
(specimen figured, 1.28 x 0.15 mm.)

oral sucker: 0.092 mm.

eggs: 0.076-80 x 0.050-53 mm.

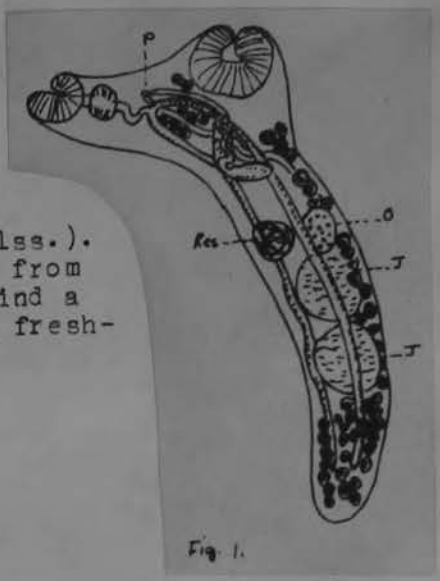


Fig. 1.

Compared with P. genu (Rud.) and P. commune (Olss.). Bovien mentions that both of these species are from marine Labridae and it is "rather curious to find a Peracreadium species in Gasterosteus caught in fresh-water."

See reprint for complete description.

Peracreadium?

Peracreadium mycteropercae (Sogandares-Bernal) Pritchard, 1966

Peracreadium

*Podocotyle* **mycteropercae**, sp. nov.[15]
(Figure 49)
Sogandares-Bernal, 1959

*Host.*—*Mycteroperca falcata* (Poey), scamp.

*Location.*—Pyloric ceca.

*Locality.*—"Bimini vicinity", B.W.I.

*Holotype.*—U.S.N.M. Helm. Coll. No. 38871.

*Diagnosis* (measurements on one mature specimen).—Body elongate, widest at level of acetabulum and tapering to a rounded end; cuticle unspined; 2.360 long by 0.540 at greatest width. Forebody 0.750 long. Hindbody 1.210 long. Oral sucker subterminal, 0.201 long by 0.201 wide. Acetabulum short pedunculated, 0.402 long by 0.369 wide. Sucker ratio 1:1.83. Prepharynx absent. Pharynx 0.101 long by 0.094 wide. Esophagus about equal to pharynx length. Ceca extending to posterior end of body, ending blindly. Genital pore slightly sinistral, midway between cecal bifurcation and acetabulum. Gonads tandem, postequatorial, intercecal. Testes roundish, smooth, almost in contact with each other; anterior testis 0.21 long by 0.2 wide; posterior testis 0.2 long by 0.2 wide. Cirrus sac extending posterior to acetabulum about halfway to ovary (in contact with ovary in immature specimens); cirrus in anterior 1/6 sac; internal seminal vesicle surrounded by prostate cells. Ovary smooth, roundish, median, slightly overlapping anterior testis; 0.15 long by 0.13 wide. Seminal receptacle club-shaped, dextral and anterior to ovary. Vitellaria extending laterally from level of anterior end of ovary to posterior end of body, overlapping ceca and portions of testes, filling posttesticular space. Uterus preovarian. Eggs (collapsed) 53 by 24 microns. Excretory pore terminal, excretory vesicle saccular, extending to level of ovary.

*Discussion.*—There are 38 species in the genus *Podocotyle* Dujardin, 1845. Of these only 6 possess a smooth ovary and cirrus sac extending posteriorly past the acetabulum; these are: *P. epinepheli* Yamaguti, 1942; *P. gracilis* Yamaguti, 1952; *P. mecopera* Manter, 1940; *P. pedicillatum* (Stossich, 1887) Stossich, 1898; *P. petallophallus* (Yamaguti, 1934) Park, 1937, and *P. serrani* Yamaguti, 1952.

*P. mycteropercae* differs from *P. gracilis* and *P. pedicillatum* by possessing vitellaria which do not reach the acetabulum, and an almost median genital pore as compared with vitellaria reaching acetabulum and a definitely sinistral genital pore. *P. mycteropercae* differs from *P. petallophallus* by possessing a smooth cirrus, short stalked acetabulum and vitellaria ending at the level of the anterior edge of the ovary, as compared with a cirrus with petaloid appendages, a longer stalked acetabulum and vitellaria extending anteriorly far beyond level of ovary. *P. mycteropercae* differs from *P. epinepheli* and *P. mecopera* in sucker ratio (1:1.83), an almost straight seminal vesicle, and genital pore almost median and between cecal bifurcation and acetabulum, as compared with sucker ratio of about 1:2.3, a convoluted internal seminal vesicle, and genital pore on outer side of cecum at level of cecal bifurcation. *P. mycteropercae* differs from *P. serrani* in that the vitellaria do not extend anteriorly much past the ovary, a more posterior acetabulum, almost straight cirrus sac extending only a short distance posterior to acetabulum, genital pore almost median on inner aspect, as compared with vitellaria clearly extending far beyond ovary, more anterior acetabulum, sigmoid-shaped cirrus sac extending for at least half its length posteriorly beyond acetabulum, and genital pore to the left of cecum.


vitellaria bear out to acetabulum

-over-

Peracreadium perezi Mathias,1926

## SUR UNE NOUVELLE ESPÈCE DE TRÉMATODE *PERACREADIUM PEREZI*, nov. sp.

PAR

Paul MATHIAS

Au mois d'avril 1926, lors d'un séjour que je fis au laboratoire de Roscoff (Finistère), j'eus l'occasion, grâce à l'obligeance de M. Marcel PRENANT, de pouvoir examiner un certain nombre de Poissons de mer, entre autres des *Labrus berggylta* et des *Crenilabrus melops*.

Dans l'intestin de quelques individus de 10 à 15 centimètres de long, appartenant à ces deux dernières espèces, j'ai trouvé un Trématode de petite taille, toujours en nombre restreint.

J'ai comparé ce parasite aux différentes espèces de Trématodes signalés d'une façon générale chez les Poissons de mer et en particulier chez ceux des côtes d'Angleterre. Je n'ai pu l'identifier à aucune des formes mentionnées dans les très nombreux travaux que j'ai consultés, aussi je crois pouvoir la décrire ici comme une espèce nouvelle.

Le Trématode rencontré dans les Labres et les Crénilabres de Roscoff est peu actif et a un aspect jaunâtre. Son corps de forme ovale est rétréci vers ses deux extrémités qui sont arrondies. Sa taille est comprise entre 0,90 mm. et 1,3 mm. de long. La plus grande largeur du corps, située au niveau du centre ou du bord supérieur de la ventouse ventrale, varie de 0,38 mm. à 0,63 mm. La ventouse orale, subterminale, mesure de 0,11 à 0,16 mm. de diamètre, la ventrale, nettement plus grande que l'orale, est allongée dans le sens transversal et a de 0,18 à 0,23 mm. de long sur 0,21 à 0,28 mm. de large. La distance entre le bord postérieur de la ventouse orale et le bord avant de la ventrale, qui est situé environ à la limite du premier et du deuxième tiers du corps, est de 0,15 à 0,29 mm.

Le tube digestif comprend un prépharynx court, un pharynx assez fort de 0,053 à 0,092 mm. de long sur 0,053 à 0,069 mm. de large, un œsophage qui a sensiblement la même longueur que le pharynx et deux cæcums qui s'étendent latéralement jusqu'au niveau du testicule postérieur. La bifurcation intestinale a lieu environ à mi-chemin entre les deux ventouses.

Les organes génitaux mâles comprennent deux testicules, non



lobés, situés très en arrière dans la région postérieure du corps. Ils ont une forme ovale et sont disposés transversalement, juste au-dessus l'un de l'autre. Le testicule postérieur est déjeté vers la droite de l'animal, l'antérieur, au contraire, un peu vers la gauche. Le testicule antérieur mesure de 0,09 à 0,11 mm. de long sur 0,14 à 0,2 mm. de large; le postérieur de 0,12 à 0,16 mm. de long sur 0,14 à 0,2 mm. de large. Juste en avant d'eux, et sur le côté droit, se trouve l'ovaire qui se présente généralement avec un contour arrondi de 0,08 à 0,10 mm. de diamètre. Le pore génital est médian et situé au niveau de la bifurcation de l'intestin. La poche du cirre est très longue et atteint facilement le tiers de la longueur totale du Trématode. Elle s'étend du pore génital jusqu'au delà du bord postérieur de la ventouse ventrale et peut arriver jusqu'au niveau de l'ovaire. Elle renferme une vésicule séminale très sinueuse. L'utérus qui débouche également au pore génital, longe le plus souvent la poche du cirre sur son côté externe et décrit quelques sinuosités entre la ventouse ventrale et le testicule antérieur. Il renferme un petit nombre

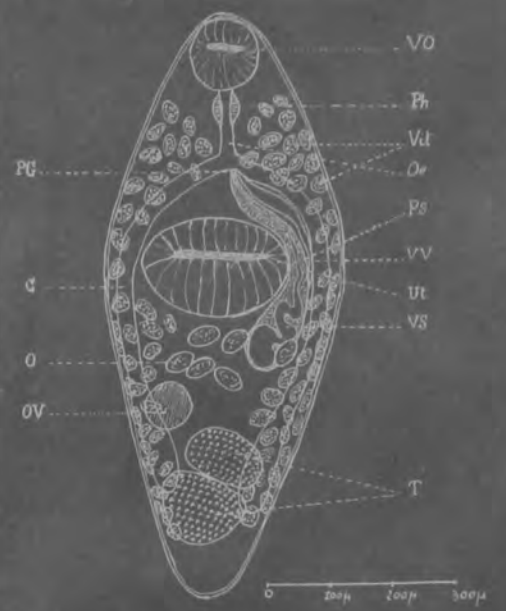



Fig. 1. — *Peracreadium Perezi*
VO, ventouse orale; VV, ventouse ventrale; Ph, pharynx; Oz, œsophage; C, cæcum; Vit, vitellogènes; Ut, utérus; Ps, poche du cirre; Vs, vésicule séminale; O, Œufs; Ov, ovaire; PG, pore génital; T, testicules.

d'œufs de forme ovale et dépourvus de filament. Ils ont en moyenne 0,069 mm. de long sur 0,038 mm. de large.

Les vitellogènes s'étendent depuis le pharynx jusqu'en arrière du testicule postérieur mais ne remplissent pas la région du corps située au delà des testicules. Ils sont constitués par des follicules nombreux, assez volumineux, particulièrement abondants dans la partie située en avant de la ventouse ventrale et dans celle comprise entre cette dernière et les testicules.

Ce Trématode se rapproche du genre *Lebouria* Nicoll (1909) par la position de ses testicules situés dans la région tout à fait postérieure du corps, mais il en diffère par la longueur de la poche du cirre qui, dans le genre *Lebouria*, est réduite. Par ce caractère, il présente au contraire des analogies avec les genres *Podocotyle* et *Peracreadium* ; son ovaire n'est pas trilobé comme chez *Podocotyle*, mais est au contraire arrondi comme chez *Peracreadium* et ses vitellogènes s'étendent en avant de la ventouse ventrale comme dans ce dernier genre. Aussi je considère ce Trématode comme un *Peracreadium*. Je dédie cette espèce à M. le Professeur Pérez qui m'a accueilli avec la plus grande bienveillance au laboratoire de Roscoff et je propose pour ce Trématode le nom de ***Peracreadium Perezi*** nov. sp.

Le genre *Peracreadium* a été créé par Nicoll en 1909. Il ne comprend aujourd'hui que deux espèces, *P. genu* Rud. et *P. commune* Olsson, dont Odhner (1901) et Nicoll (1910) ont donné des descriptions détaillées. Ces deux espèces se distinguent l'une de l'autre par la forme de la ventouse ventrale et surtout par la distribution des vitellogènes, mais, dans les deux espèces ceux-ci remplissent toujours la région en arrière des testicules.

*Peracreadium Perezi* diffère de *P. genu* et de *P. commune* par la position de ses testicules situés très en arrière, et par la répartition de ses vitellogènes qui s'étendent du pharynx jusqu'au niveau du bord postérieur du testicule inférieur, mais ne remplissent pas l'espace situé en arrière des testicules. Le recul des testicules vers l'extrémité postérieure du corps chez *P. Perezi* est comparable à ce qui a été observé par Nicoll (1914) chez un spécimen de *Podocotyle* nommé *Podocotyle atherinæ*.



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PERACREADIUM